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10/749,646	12/31/2003	Wenguang Li	066243-0243 (141218)	9408

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GE MEDICAL SYSTEM  
C/O FOLEY & LARDNER LLP  
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EXAMINER
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ABRAHAM, SALIEU M

ART UNIT	PAPER NUMBER
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3768

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/749,646	<b>Applicant(s)</b> LI ET AL.	
	<b>Examiner</b> SALIEU M. ABRAHAM	<b>Art Unit</b> 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 8 and 10-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8, 10-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### Response to Remarks/Arguments

1. Examiner acknowledges Applicant's cancellation of claims 1-7 and 9, and amended claims 8, 10, 19, 20 and 25. Further, examiner withdraws prior claim objections in light of applicant amendments. Therefore, claims 8 and 10 - 27 are currently pending.
2. Upon further review of the art of record and in light of the cancelled and amended claims, the prior indication of allowable subject matter for claims 15 - 19 is hereby withdrawn and new grounds of rejection have been made as articulated in the detailed action below.
3. Applicant's arguments with regard to claims 8 and 10 - 27 filed September 13, 2008 have been fully considered, but they are not persuasive in light of the new grounds of rejection. The new grounds of rejection were met by art of record and as such did not require an updated or new search.
4. The instant Office Action is made **non-final** in light of the withdrawal of allowable subject matter.

### Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

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obviousness rejections set forth in this Office action: (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 8 and 10 -19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pub. No. US 2003/0093067 A1 to Panescu (Panescu) in view of US Pat. No. 5,997,883 to Epstein (Epstein).

In Reference to Claim 8

**Panescu** teaches a method comprising generating an image of an organ or structure inside a body (**see abstract, figures 2 and 7A, and sections 0005 and 0039**).

Panescu further the step “further comprising spatially registering the representation of the probe with the image” (**see section 0008**) and simultaneously displaying the image and a representation of a probe, the image and representation of the probe corresponding substantially the same point in a bodily cycle(**see section 0010**).

**However**, Panescu fails to also teach a method “which is substantially correlated to a

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point in a bodily cycle, the image being generated by interpolating between or extrapolating from at least two other images of the organ or structure taken at other points of the bodily cycle.”

**Epstein** teaches the acquisition of (MR) images based upon reference points in a bodily cycle such as the cardiac cycle in order to accurately correlate systolic with diastolic phase when reconstructing images at select points in the cardiac cycle (**see abstract, figures 2 and 4-6, and column 4, lines 4-6**). The invention allows the heart to be depicted at “phase of its cycle” and images reconstructed based on correlated cardiac cycle reference points (**see column 4, lines 31-35**). He further discloses where “the image being generated by interpolating between or extrapolating from at least two other images of the organ or structure taken at other points of the bodily cycle” in order to help ensure that “a more accurate” final image is produced independent of variations in cardiac phase and heart rate (**see columns 2, lines 27 - 48**).

Therefore, the invention of Epstein uses individual points in the cardiac cycle as a common reference for correlating images and image similar to applicant’s use of the same point in the bodily (cardiac) cycle to register the probe with the image of an organ or structure in the body (**see column 3, lines 45-57**).

**Therefore**, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the step of generating a composite image by " interpolating between or extrapolating from at least two other images of the organ or

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structure taken at other points of the bodily cycle” as employed by Epstein in the image acquisition method according to Panescu in order to minimize the effect that bodily cycle and heart rate variations can have on the image(s) acquired in order to produce more accurate final images as taught by Epstein.

In Reference to Claim 10

**Panescu** in view of Epstein has been shown to teach all of the limitations of claim 1.

Panescu further teaches the step “wherein the image is acquired using computed tomography, magnetic resonance, or ultrasound” (**see figure 5 and section 0008**).

**Therefore**, Panescu in view of Epstein further teaches all claim 10 limitations.

In Reference to Claim 11

**Panescu** in view of Epstein has been shown to teach all of the limitations of claim 8.

Panescu in view of Epstein further teaches the step “wherein the organ or structure inside the body comprises a heart and the bodily cycle is a cardiac cycle” as discussed above (**see Epstein abstract and figure 2**).

**Therefore**, Panescu in view of Epstein further teaches all claim 11 limitations.

In Reference to Claim 12

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Panescu in view of Epstein has been shown to teach all of the limitations of claim 1.

Additionally, Panescu in view of Epstein further teaches the step “the step “wherein the probe is configured to sense the electrical properties of the organ or structure inside the body” (see **Epstein figures 7 and 8**).

**Therefore** Panescu in view of Epstein further teaches all claim 12 limitations.

In Reference to Claim 13

**Panescu** in view of Epstein has been shown to teach all of the limitations of claim 8.

Furthermore, Panescu also teaches the step “wherein the image was acquired prior to the probe being located inside the body” (see **sections 0007 - 0009**).

**Therefore**, Panescu in view of Epstein further teaches all claim 13 limitations.

In Reference to Claim 14

**Panescu** in view of Epstein has been shown to teach all of the limitations of claim 8.

Furthermore, Panescu also teaches the step “wherein the acquiring step comprises storing the image on a computer readable medium” (see **figure 1, reference mark 126 and sections 0039-0041**).

**Therefore**, Panescu in view of Epstein further teaches all claim 14 limitations.

In Reference to Claims 15 - 19

See claim rejections 8 and 10 -12 supra.

7. Claims 20-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pub. No. US 2003/0093067 A1 to Panescu (Panescu) in view of US Pat. No. 5,997,883 to Epstein (Epstein) and further in view of US Pat. No. 6,216,027 B1 to Willis (Willis).

In Reference to Claim 20

**Panescu in view of Epstein** teaches a system comprising:

- “memory configured to store an image of an organ or structure of a body” (**see Panescu figure 1, reference marks 104 and 126 and sections 0039-0041**),  
and
- the image being generated by interpolating between or extrapolating from at least two other images of the organ or structure taken at other points of the bodily cycle.”  
(**see Epstein abstract, figures 2 and 4-6, and column 4, lines 4-6**).

However, Panescu in view of Epstein does explicitly disclose:

- a display configured to simultaneously illustrate the image of the organ or structure of the body substantially correlated to a point in the bodily cycle with a representation of a probe which is in or adjacent to the organ or structure of the body and the image, the representation of the probe being registered with the



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image at substantially the same point in a bodily cycle.

Willis teaches :

- a display configured to simultaneously illustrate the image of the organ or structure of the body substantially correlated to a point in the bodily cycle with a representation of a probe which is in or adjacent to the organ or structure of the body and the image (**see column 2, lines 32-36**); the representation of the probe being registered with the image at substantially the same point in a bodily cycle (**see column 2, lines 36-44 and figures 30A and 30B**).

Willis states that the system of his invention improves tracking the placement of medical devices such as catheters in the heart for diagnostic and/or therapeutic purposes.

**Therefore** it would have been obvious to one of ordinary skill in the art at the time of the invention to have included the display with capabilities of Willis as described above in the system of Panescu in order to enhance the accuracy of tracking probe placement within an organ such as the heart as explicitly taught by Willis.

#### In Reference to Claim 21

**Panescu** in view of Willis has been shown to teach all of the limitations of claim 20.

Furthermore, Panescu also teaches the system “wherein the organ or structure of the

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body comprises a heart and the bodily cycle is a cardiac cycle” (see **figure 1, and column 2, lines 26-36**).

**Therefore**, Panescu in view of Epstein and further in view of Willis further teaches all claim 21 limitations as well.

In Reference to Claim 22

**Panescu in view of Epstein and further in view of Willis** has been shown to teach all of the limitations of claim 21.

Furthermore, Panescu also teaches the system “wherein the display is configured to simultaneously display a map of electrical properties of the heart in conjunction with the image and the representation of the probe (**see figure 1, reference marks 104, 106, 142, 146 and 126, sections 0008 and 0050**).

**Therefore**, Panescu in view of Epstein and further in view of Willis further teaches all claim 22 limitations.

In Reference to Claim 23

**Panescu in view of Epstein and further in view of Willis** has been shown to teach all of the limitations of claim 21.

Furthermore, Panescu also teaches the system “wherein the display is configured to simultaneously display electrical properties of the heart for at least one location of the

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probe in conjunction with the image and the representation of the probe” (**see sections 0039, 0044 and 0050**).

**Therefore**, Panescu in view of Epstein and further in view of Willis further teaches all claim 23 limitations.

In Reference to Claim 24

**Panescu in view of Epstein and further in view of Willis** has been shown to teach all of the limitations of claim 20.

Furthermore, Panescu also teaches the system “wherein the image is at least a three dimensional image” (**see sections 007-0009**).

**Therefore**, Panescu in view of Epstein and further in view of Willis further teaches all claim 24 limitations.

In Reference to Claim 25

**Panescu in view of Epstein and further in view of Willis** has been shown to teach all of the limitations of claim 20.

Furthermore, Panescu also teaches the system ‘wherein the image comprises one or more images acquired using computed tomography, magnetic resonance, or ultrasound” (**see section 0008**).

**Therefore**, Panescu in view of Epstein and further in view of Willis further teaches all

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claim 25 limitations.

In Reference to Claim 26

**Panescu in view of Epstein and further in view of Willis** has been shown to teach all of the limitations of claim 20.

Furthermore, Panescu also teaches the system “wherein the representation of the probe is spatially registered with the image” (**see section 0007**).

**Therefore**, Panescu in view of Epstein and further in view of Willis further teaches all claim 26 limitations.

In Reference to Claim 27

**Panescu in view of Epstein and further in view of Willis** has been shown to teach all of the limitations of claim 20.

Furthermore, Panescu also teaches the system “wherein the system is an electrophysiology monitoring system (**see figures 7A-9B, sections 0007 and 0050**).

**Therefore**, Panescu in view of Epstein and further in view of Willis further teaches all claim 27 limitations.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to

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applicant's disclosure. Xue et al., Chenal et. al., Willis et. al., Osadchy et al., Panescu et al. and Nolte et al. have been included because they all encompass MR, CT or ultrasound imaging systems and methods that are strongly related to electrophysiology studies and applications as described by the applicant. Additionally, Pearlman has been included because his invention involves imaging methodology and apparatus that reconstructs a single composite image or image set from two images or image sets at different time points. This is done in order to enhance or more accurately display any event(s) that transpired between the image acquisition time points.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Salieu M. Abraham whose telephone number is (571) 270-1990. The examiner can normally be reached on Monday through Thursday 8:30 am - 6:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on (571) 272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SA

8/21/08

/Brian L Casler/

Supervisory Patent Examiner, Art Unit 3737